

Remarks

Claims 1-53 were pending. Claims 3, 6-9, 27-30, 32-33, 35-37, 39-40, and 42-53 were previously withdrawn from consideration. Claims 1, 2, 4, 5, 10-26, 31, 34, 38, and 41 were elected for examination and are thus pending. Applicants respectfully request that if a generic claim is finally held to be allowable, all species should be examined. No claims have been amended or added.

Based on the following remarks, Applicants respectfully request reconsideration of the outstanding rejections and passage of the claims to allowance.

§ 102 Rejections

Claims 1, 18-20, 31 and 34 were rejected under 35 USC § 102(b) as being anticipated by Kuo et al (U.S. Pat. No. 6,292,244). Claims 1-2, 4-5, 11-12, 16-18, 22-23, 25-26 and 38 were rejected under 35 USC § 102(e) as being anticipated by Seiberle et al (U.S. Pat. No. 6,876,417). Applicants respectfully traverse.

Claim 1 recites a method that includes “exposing an alignment material to an interference pattern to cause a chemical reaction in the alignment material.” (emphasis added). Neither Kuo nor Seiberle disclose this feature.

In contrast, Kuo teaches uses mechanical masking using single or multiple beams of incoherent, linearly polarized ultraviolet (LPUV) light. For example, Kuo, at col. 4, lines 27 et seq., teaches the exposure of layer 612 to two LPUV light beams transmitted through mask 614. No interference pattern is formed with this illumination technique, nor is an interference pattern exposure suggested by Kuo’s technique. An interference pattern is not created simply by intersecting two polarized or unpolarized beams. Instead, an interference pattern requires the superposition of coherent waves. See the present specification, at page 10, lines 10 -13 – “The beams are also coherent and form an interference pattern in the overlapping region. The interference pattern includes fringes of relatively high intensity 150 and relatively low intensity 160, but the radiation in each fringe has a similar polarization state.”

Under 35 U.S.C. §102, the cited reference must show each and every feature of the claimed invention. The rejection of claims 1, 18-20, 31 and 34 under 35 USC § 102(b) as being anticipated by Kuo et al has been overcome and should be withdrawn.

Regarding Seiberle, this reference also fails to disclose exposing an alignment material to an interference pattern. In contrast, Seiberle exposes a layer 2 to an illumination pattern formed by transmitting an incoherent illumination (a mercury lamp, see col. 5, lines 25-26) beam through an amplitude (or intensity) mask 8. As with the Kuo reference, no interference pattern is formed with this illumination technique, nor is an interference pattern exposure suggested by Seiberle's technique.

Accordingly, the rejection of claims 1-2, 4-5, 11-12, 16-18, 22-23, 25-26 and 38 under 35 USC § 102(e) as being anticipated by Seiberle et al has been overcome and should be withdrawn.

§ 103 Rejections

Claims 10, 13-15 and 21 were rejected under 35 USC § 103(a) as being unpatentable over Seiberle et al in view of Yamada et al (U.S. Pat. No. 6,067,141). Claim 24 was rejected under 35 USC § 103(a) as being unpatentable over Seiberle et al in view of Hirata et al (U.S. Pat. No. 5,652,634). Further, claim 41 was rejected under 35 USC § 103(a) as being unpatentable over Seiberle et al in view of Kelsey et al (U.S. Publ. No. 2002/0149849).

The Yamada, Hirata, and Kelsey references were cited in the previous office action. Applicants addressed those references in their remarks dated 9/22/05. Applicants hereby incorporate those remarks by reference.

Applicants traverse for the following reasons:

1. Seiberle and Yamada

The combination of Seiberle and Yamada does not render claims 10, 13-15 and 21 unpatentable because a *prima facie* case of obviousness has not been established. In particular, Yamada fails to overcome the deficiencies of Seiberle (described above), in that neither reference teaches or suggests at least “exposing an alignment material to an interference pattern to cause a chemical reaction in the alignment material.” Regarding Yamada, that reference is directed to the application of a voltage across a liquid crystal layer (not an exposure to any light pattern, let alone an interference pattern). Accordingly, even if one of ordinary skill in the art were to have

combined Seiberle and Yamada, the combination would not produce Applicants' claimed invention.

2. Seiberle and Hirata

The combination of Seiberle and Hirata does not render the claim 24 unpatentable because a *prima facie* case of obviousness has not been established. In particular, Hirata fails to overcome the deficiencies of Seiberle (described above), in that neither reference teaches or suggests “exposing an alignment material to an interference pattern to cause a chemical reaction in the alignment material.” Hirata does not teach or suggest exposing an alignment material to an interference pattern. Instead, Hirata teaches a mask exposure method, whereby the mask is moved after initial exposure (see e.g., Hirata, col. 14, lines 6-18).

Accordingly, even if one of ordinary skill in the art were to have combined Seiberle and Hirata, the combination would not produce Applicants' claimed invention. As such, Applicants respectfully submit that the pending claims are patentable over Seiberle and Hirata.

3. Seiberle and Kelsey

The combination of Seiberle and Kelsey does not render claim 41 unpatentable because a *prima facie* case of obviousness has not been established. In particular, Kelsey fails to overcome the deficiencies of Seiberle (described above), in that neither reference teaches or suggests “exposing the alignment material to a liquid crystal, wherein the liquid crystal aligns relative to the alignment material based on the interference pattern.”

Kelsey describes a method of holographic or interference lithography, where “holey fibers” (i.e., optical fibers containing regular holes or cavities in the fiber) are used to transport light used to form a holographic pattern. The use of fibers is described as providing for a flexible lithographic tool and allows for the replacement of spatial filters. See Kelsey, paras. 0042 and 0043. Kelsey is silent as to the recited step of exposing the alignment material to a liquid crystal, wherein the liquid crystal aligns relative to the alignment material based on the interference pattern.

Further, one of ordinary skill in the art would not have been motivated to modify Seiberle by replacing the mercury lamp-mask system with Kelsey's holey fiber lithographic system.

For at least the reasons stated above, the cited references, either taken alone, or in combination, do not teach or suggest the features recited in the independent claims. As such, Applicants respectfully submit that the pending claims are patentable over the cited references.


Conclusion

In view of the above, it is submitted that the application is in condition for allowance. Reconsideration of the application is requested. Please contact the undersigned should there be any questions or in order to expedite prosecution.

Respectfully submitted,

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